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Giving Guys Get the Girls: Men Appear More Desirable to the Opposite Sex When Displaying Costly Donations to the Homeless

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Abstract: One of the evolutionary adaptive benefits of altruism may be that it acts as an honest (reliable) signal of men's mate quality. In this study, 285 female participants were shown one of three video scenarios in which a male target took £30 out of a cash machine (ATM) and gave either a lot (£30), a little (£1), or nothing to a homeless man. The participants rated the male target on his attractiveness, their short- and long-term mate preferences towards him, and the degree to which they thought he was likely to possess various parenting qualities. The results showed that, regardless of whether the man was described as rich or poor, participants rated him as being more attractive when he donated money, but only when the donation was costly (£30). In addition, altruism was shown to be important in long-term, but not short-term mate choice, and displays of altruism were associated with positive parenting qualities. It is argued that displays of altruism act as a reliable (honest) mate signal for a potential long-term parental partner.

Keywords: altruism; costly signalling; attraction; parenting qualities; mate choice

1. Introduction

Whilst there are a number of established adaptive explanations as to why we help others at a cost to ourselves (Alexander 1987; Buss 2004; Hamilton 1964; Maynard Smith 1964; Trivers 1971), these theories tend to focus on helping kin or involve reciprocation. More recently, the literature has suggested that, in some part, altruism may also be driven through sexual selection, specifically through female mate choice (Bhagal et al. 2016; Farrelly and King 2019; Iredale et al. 2008; Van Vugt and Iredale 2013). For example, we see sexual differences in the way in which altruism is expressed. Women tend to engage in more private one-to-one helping (Aries and Johnson 1983; Miller 1976), whereas men engage in more conspicuous displays of altruism, either through large donations or publicised acts of helping (Eagly and Crowley 1986; Johnson 1996; Van Vugt et al. 2007). Men may be displaying altruism more conspicuously because women consider it attractive. Much like peacocks' tails, peahens select peacocks with the largest, brightest plumage because it signals an underlying quality as a mate (Petrie 1994).

This theory was initially inspired by Goldberg's (1995), Latané's (1970), and Mulcahy's (1999) street observations in the US and UK, showing gender differences amongst donors giving to the homeless. Goldberg (1995) observed examples of giving to the homeless as a form of human altruism that is neither kin-directed nor reciprocal, since it was unlikely the homeless man was a relative or could reciprocate help. He found that male passers-by, when alone, gave disproportionately more to homeless women than to homeless men. However, when in the company of women, men disproportionately

avoided donating to women panhandlers. [Mulcahy \(1999\)](#) further tested [Goldberg's \(1995\)](#) findings, by interviewing heterosexual couples after the man had donated, and found that donations were not dependent on the man's income but on the status of their relationship. Specifically, those in the earlier stages of the relationship were more likely to give to the homeless than those in long-term established relationships. Whilst these studies show men will preferentially give when observed by females (as a form of mate signal), they say less about female mate preferences towards these men. Here, for the first time, we re-enact scenarios in which a male actor gives to someone who appears to be homeless (actor) and ask females to rate their mate preferences towards him. In doing so, we explore whether displays of altruism are considered an attractive mate quality for long-term or short-term mates and whether the cost of the altruistic display matters.

1.1. Showing Off Altruism to the Opposite Sex

Altruism as a mate signal comes from the fact that altruism is discriminately shown off in the presence of a potential mate, and this seems to be particularly true for men rather than women. Among hunter–gatherer societies, men who regularly provide large animal meat have more sexual partners ([Hawkes 1993](#); [Hawkes and Bird 2002](#)). In restaurants, groups of men leave much better tips for waitresses than groups of women, and men on dates with women leave especially good tips ([Miller 2001](#)). Compared to women, men have also shown a greater bias towards opposite sex partners in the standard and charity dictator games ([Farrelly et al. 2007](#)). In a lab-based experiment, men, but not women, showed off charity donations significantly more in the presence of opposite sex observers compared to same sex or no observers ([Iredale et al. 2008](#)). Men even compete to show off altruism in the presence of a woman ([Barclay and Willer 2007](#); [Roberts 1998](#)). Men sequentially increased their public donations when observed by a woman compared to another man or no observer in both Western and non-Western populations ([Tognetti et al. 2012](#); [Tognetti et al. 2016](#); [Van Vugt and Iredale 2013](#)). Furthermore, when observing other men donate money to an attractive online female fundraiser, men compete to increase their donations ([Raihani and Smith 2015](#); [Roberts 2015](#)). [Arnocky et al. \(2017\)](#) found that whilst both sexes who scored higher on self-reported altruism measures and who donated more in dictator games claimed to have a higher number of sex partners than those who did not, this was stronger for men than for women.

However, more recently, [Bhagal et al. \(2019\)](#) found that when faced with an attractive (rather than less attractive) member of the opposite sex, both men and women would increase their displays of altruism.

1.2. Is Altruism a Signal That Is Attractive to the Opposite Sex?

If altruism is a true mate signal, then not only must it be shown off towards potential mates, but it must be selected for by the opposite sex as attractive ([Searcy and Nowicki 2005](#)). Indeed, there is evidence to suggest that this is true; acts of heroism ([Kelly and Dunbar 2001](#); [Rusch et al. 2015](#)), compassion ([Howard et al. 1987](#)), and talking positively about giving help ([Jensen-Campbell et al. 1995](#)) tend to be preferred as mate qualities, but more by women than by men. But why should altruism be selected more as a mate quality by women than men? After all, both sexes should benefit from an altruistic mate ([Buss 1989](#)). One argument is that due to higher reproductive and parental costs ([Bateman 1948](#); [Trivers 1972](#)), women should be choosier with whom they mate and therefore may be more sensitive towards mate cues than men ([Kniffin and Wilson 2004](#)). This may account for why men show off altruism in the presence of a potential mate more than women ([Iredale et al. 2008](#)). [Phillips et al. \(2008\)](#) developed a Mate Preference towards Altruistic Traits (MPAT) scale to measure mate preferences for altruism in the opposite sex. They found that although both sexes preferred altruistic mates, women responded significantly more positively to the MPAT scale, expressing stronger preference for altruistic mates than men. [Barclay \(2010\)](#) similarly found that both sexes were more willing to have long-term relationships with altruists after reading simulated dating adverts, but women also preferred altruists for single dates, whereas men did not.

However, the answer is not always so clear cut. In a recent study by [Farrelly and King \(2019\)](#), when men and women viewed images of the opposite sex accompanied by different altruistic scenarios, both men and women rated those who were described as altruistic as more desirable as a mate.

1.3. Is Altruism an Honest Mate Signal?

Signals that are costly to display may be considered “honest” (reliable indicators of underlying quality) as only those who can truly afford the cost can display them ([Grafen 1990](#); [Zahavi 1975](#); [Zahavi 1977](#)). For example, purchasing a very expensive car provides reliable information that the owner is wealthy, since only the wealthy could afford such frivolous non-essentials. The perceiver of the signal can therefore be confident that the signaller has the underlying quality.

Although both sexes may value altruistic qualities in a mate ([Phillips et al. 2008](#)), due to the higher reproductive costs, costly signals of altruism—because they constitute an honest signal—may be preferred by women most of all ([Bateman 1948](#); [Long and Campbell 2015](#); [Trivers 1972](#)). From an evolutionary perspective, women who discriminate between men of high quality would have a fitness advantage over those who do not ([Zahavi 1975](#)).

Altruism, by its very definition, is costly; an act that is personally costly but increases the benefits to others ([Van Vugt and Van Lange 2006](#)). However, the extent to which the act is personally costly may vary. Donating loose change to charity may be considered altruistic, since the behaviour is beneficial to others at the cost of the giver; however, the cost is relatively low and almost anyone could display low-cost altruism. On the other hand, donating half of one’s annual income to charity also increases the benefits to others but at much higher cost to the giver; therefore, only a select few could afford to display high-cost altruism. Interestingly, a recent study by [Bhagal et al. \(2020\)](#) found exactly that; those who donated half of their money away in a dictator game were considered more attractive than those who gave nothing. More importantly, actors who donated all of their money were not seen as attractive as those who donated half. This suggests the level of costs displayed are important. Giving everything away, whilst highly costly, could also be seen as frivolous and less attractive. According to the handicap principle ([Zahavi 1975](#); [Zahavi 1977](#); [Zahavi 1995](#)), if altruism is an honest signal then women should prefer men who present acts of altruism that are costly, since only high-quality men could afford to carry high costs. However, if the display is too costly, it may signal a lack of judgment or ability to provide for offspring ([Bhagal et al. 2020](#)). The current study aimed to test whether donations to a homeless person, that were higher than usual or lower than usual, affected women’s mate preferences. According to the [Charities Aid Foundation \(2019\)](#), £20 is the median monthly amount people give to donations and sponsorships in the UK. Therefore, a one-off donation of £30 (all the money that was taken out of the cash (ATM) machine in the current study) would be considered costly, whereas £1 was considered within most people’s reach and therefore not costly.

1.4. What Mate Quality Is Altruism Signalling?

If altruism is a mate signal, then what is it signalling? Both sexes are looking for qualities of fitness in their partner, but this can be displayed through genetic quality; good genes that will translate into offspring survival ([Chandler et al. 2013](#)), and good parental qualities that increase the chances of the offspring surviving to reproductive age ([Kokko 1998](#)). If women are attracted to men who signal altruism, then displays of altruism by men should signal an underlying message that is important to women’s mate choices. The literature suggests that women are attracted to mates who signal good gene quality, resources, and parental care ([Buss and Schmitt 1993](#)). Therefore, if altruism is an attractive quality in a mate, a man who displays altruism should be associated with some or all of these mate qualities. [Tessman \(1995\)](#) suggests that cooperative behaviour has been sexually selected to signal the positive characteristics necessary in a reliable mate and parent. Similarly, [Roberts \(1998\)](#) suggests that altruism is a reliable signal of the quality of an individual as a good partner, and [Powell and Van Vugt \(2003\)](#) suggest it signals willingness to commit to a relationship. By contrast, [Miller \(2001\)](#) views

human cooperation as an indicator of genetic fitness and [Bliege Bird et al. \(2001\)](#) believe that altruism advertises status and resources.

One way to test whether altruism is a signal of good genes vs. good parental qualities is to test short-term vs. long-term mating preferences towards mates that display that behaviour. Women show greater preference for short-term relationships with men who exert signals of good gene quality and greater long-term mating preferences towards those who express good parental qualities ([Penton-Voak et al. 1999](#)). When presented with cooperation vignettes and the MPAT scale, women did not have marked preferences for cooperative men as short-term mates over long-term mates ([Farrelly 2013](#)). Even when women were in their fertile stage of their menstrual cycle (and more sensitive to short-term mating cues), they did not express a stronger MPAT preference than when in the non-fertile stage of their menstrual cycle ([Farrelly 2011](#)). Indeed, photographs of low attractive men, when paired with vignettes of altruistic acts, were considered more desirable by women, but only for long-term relationships ([Farrelly et al. 2016](#)), and a preference for pro-social traits was shown by women in long-term rather than short-term mates ([Margana et al. 2019](#)). In this paper, we asked a number of long-term and short-term mating questions to further understand whether altruism is a signal of good genes or good parental care, and we explore what mate qualities are associated with displays of altruism.

1.5. Giving to the Homeless as an Altruistic Mate Signal

In the present study, we showed female participants video clip scenarios in which a man (an actor) donated, or not, to a homeless person (also an actor), similar to the street observations by [Goldberg \(1995\)](#) and [Mulcahy \(1999\)](#). In these scenarios, the same male actor can be seen giving £30, £1, or nothing to another male actor posing as being homeless. This paper is the first to use video replications of [Goldberg's \(1995\)](#), [Latané's \(1970\)](#), and [Mulcahy's \(1999\)](#) original observations. Traditionally, vignettes and photographs are used in attraction studies; however, static stimuli do not always accurately convey a person's physical appearance, compared to actually seeing the person in the flesh ([Ambady et al. 1999](#); [Ambady and Rosenthal 1993](#); [Morrison et al. 2007](#)). Additionally, one of the potential confounding variables of using financial donations is that it is not clear whether women are paying attention to the level of a man's resources or to the act of giving to help another. Although conspicuous consumption (public displays of wealth) may signal resources, it says nothing about willingness to *share* resources, and a man who has resources but is unwilling to share them should be less attractive as a mate ([Buss and Schmitt 1993](#)). In an attempt to address this potential problem, the male actor is always shown taking the same amount of money out of a cash (ATM) machine (£30—the equivalent of USD 37) before coming across the homeless man, but before they viewed the video, half of the participants were told he was rich and half the participants were told he was poor.

Hypothesis one: Based on costly signalling theory ([Grafen 1990](#); [Zahavi 1975](#); [Zahavi 1977](#)), it is expected that the cost of the altruistic act will matter. That is, if altruism is a signal of honest mate quality, then the more the man donates to a homeless person, the more attractive women will perceive him to be. Hypothesis two: If women are paying attention to the act of altruism, rather than the level of wealth, then the man's level of existing wealth should not affect the level of attractiveness across the altruism conditions. Hypothesis three: Displays of altruism will be considered important for long-term mating but not short-term dating. Hypotheses four: Altruism will be associated with good parental qualities.

2. Results

In the rich condition ($M = 4.67$, $SD = 1.40$), the man was considered to be significantly richer than in the poor condition ($M = 3.01$, $SD = 1.35$) ($F(1, 278) = 105.91$, $p < 0.001$, $\eta_p^2 = 0.28$). There were also significant differences in rich ratings across the altruism conditions ($F(2, 278) = 9.72$, $p < 0.001$, $\eta_p^2 = 0.07$). Post hoc tests revealed that the man was considered to be significantly richer in the high-cost altruism condition ($M = 4.30$, $SD = 1.66$) than in both the low-cost ($M = 3.49$, $SD = 1.57$)

($p < 0.001$, $d = 0.50$) and the no ($M = 3.77$, $SD = 1.43$) altruism conditions ($p < 0.001$, $d = 0.34$). There was not, however, any significant difference in the rich ratings between the low-cost and no altruism conditions ($p = 0.993$, $d = 0.19$).

Due to the wide age range in our sample, we checked whether the age of the participant correlated with the ratings of the actor's attractiveness. No relationship was found between age and attractive ratings ($r(279) = 0.05$, $p = 0.43$). We also checked whether there was a difference in participants' ratings of attractiveness depending on whether they reported being in a relationship or not, but no significant difference was found between those in a relationship ($M = 4.08$, $SD = 1.43$) and those who were not ($M = 3.76$, $SD = 1.53$) ($t(160.77) = 1.63$, $p = 0.11$). Therefore, neither age nor relationship status were included in any further analyses.

2.1. Hypotheses One and Two: Costly Displays of Altruism Are More Attractive Regardless of Wealth

Participants' attraction to the man did not significantly differ between the poor ($M = 4.05$, $SD = 1.42$) and rich ($M = 3.89$, $SD = 1.53$) conditions ($F(1, 278) = 1.03$, $p = 0.310$, $\eta_p^2 = 0.00$), but it did between the altruism conditions ($F(2, 278) = 6.60$, $p < 0.001$, $\eta_p^2 = 0.05$). A post-hoc analysis demonstrated that ratings of attractiveness were significantly higher in the high-cost altruism condition ($M = 4.41$, $SD = 1.48$) than in the low-cost ($M = 3.69$, $SD = 1.43$) ($p < 0.001$, $d = 0.49$) and in the no ($M = 3.86$, $SD = 1.42$) altruism conditions ($p = 0.027$, $d = 0.38$). There was, however, no significant difference in attractiveness ratings between the low-cost and the no altruism conditions ($p = 0.704$, $d = 0.12$), suggesting that only costly signals of altruism are considered to be attractive mate qualities (see Figure 1). No interaction was found between altruism and wealth ($F(2, 278) = 0.24$, $p = 0.790$, $\eta_p^2 = 0.00$).

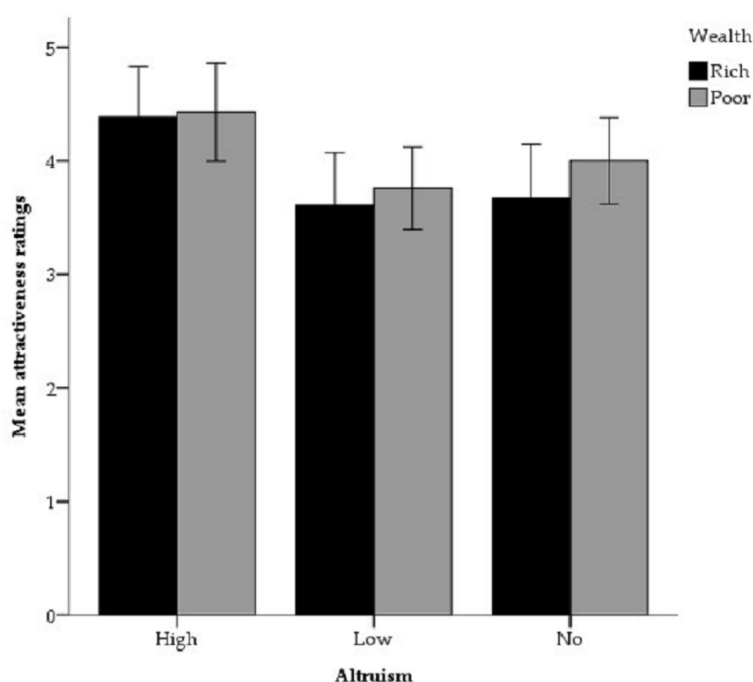


Figure 1. Mean attractiveness ratings in the high-cost, low-cost, and no altruism conditions when the actor was described as rich compared to when he was described as poor (error bars represent 95% confidence intervals).

We also considered whether participants' own wealth might have an influence on attractiveness ratings, since women with their own wealth are less concerned for cues of wealth in men (Moore et al. 2006). Participants were asked to rate how wealthy they considered themselves to be from 1 ("not at all") to 7 ("very much"), but when factoring in their perception of their own wealth as a covariate, the

difference in attraction remained driven by displays of altruism ($F(2, 277) = 6.57, p = 0.022, \eta_p^2 = 0.05$), not the participants' ratings of their own of wealth ($F(1, 277) = 0.031, p = 0.86, \eta_p^2 = 0.00$).

2.2. Hypothesis Three: Altruism Is a Signal of Long-Term but Not Short-Term Mate Quality

When participants were asked to rate the likelihood of them having a one-night stand with the man in the video (short-term mating), there was no significant difference between the poor ($M = 2.33, SD = 1.75$) and rich ($M = 2.10, SD = 1.56$) conditions ($F(1, 276) = 1.44, p = 0.231, \eta_p^2 = 0.01$) nor across the altruism conditions ($F(2, 276) = 1.24, p = 0.290, \eta_p^2 = 0.01$) (see Figure 2). There was also no significant interaction between wealth and altruism ($F(2, 276) = 0.09, p = 0.918, \eta_p^2 = 0.00$).

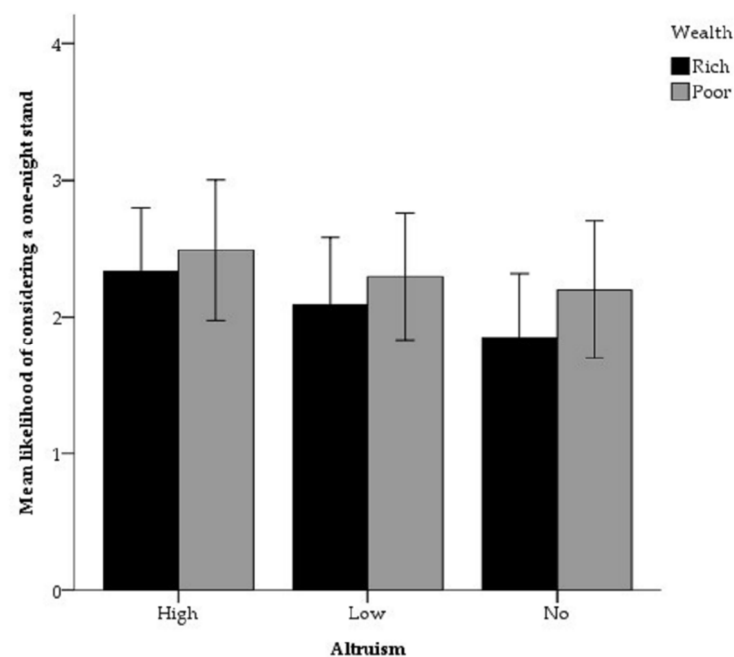


Figure 2. The likelihood that participants in the high-cost, low-cost, and no altruism conditions would consider having a one-night stand with the actor when he was described as rich compared to when he was described as poor (error bars represent 95% confidence intervals).

However, when asked how likely they would be to consider a long-term relationship with the man, whilst there was no significant difference between the rich ($M = 3.54, SD = 1.97$) and poor ($M = 3.52, SD = 1.70$) conditions ($F(1, 275) = 0.09, p = 0.771, \eta_p^2 = 0.00$), there was a significant difference across the altruism conditions ($F(2, 275) = 43.14, p < 0.001, \eta_p^2 = 0.24$) (see Figure 3). A post hoc analysis revealed that participants were more likely to consider a long-term relationship with the actor in the high-cost ($M = 4.74, SD = 1.73$) than that in the low-cost ($M = 3.21, SD = 1.57$) altruism condition ($p < 0.001, d = 0.93$). They were also significantly more likely to consider a long-term relationship with the actor in the high-cost than that in the no ($M = 2.63, SD = 1.50$) altruism conditions ($p < 0.001, d = 1.30$) and in the low-cost than in the no altruism conditions ($p = 0.036, d = 0.38$). This suggests that even non-costly signals of altruism are important in long-term relationships.

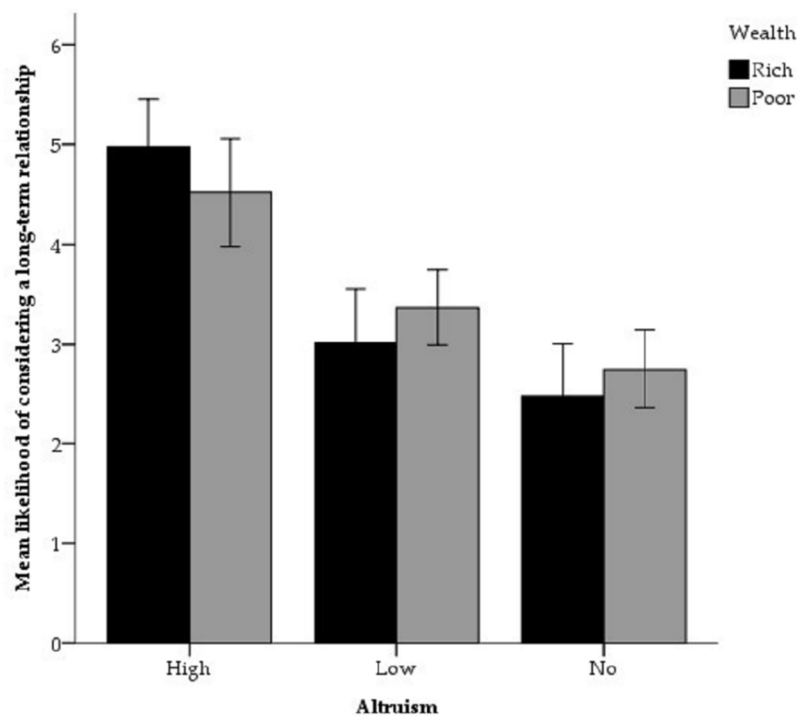


Figure 3. The likelihood that participants would consider having a long-term relationship with the actor in the high-cost, low-cost, and no altruism conditions when he was described as rich and when he was described as poor (error bars represent 95% confidence intervals).

2.3. Hypothesis Four: Displays of Altruism Are Associated With Good Parenting Skills

If altruism is a signal of long-term mate (good dad) qualities, then it should also be associated with other good parental skills (Kruger et al. 2003). An exploratory factor analysis was conducted using a principal-axis factor extraction to determine whether any of these qualities were related together (see Table 1).

Table 1. Factor loadings of associated with good parental skills.

	Factor 1	Factor 2
	Parental Qualities	Rich and Powerful
Kind	0.855	−0.185
Good at bringing up children	0.849	−0.090
Sympathetic	0.844	−0.190
Loyal to partner	0.767	−0.255
Brave	0.681	−0.017
Intelligent	0.675	0.388
Rich	0.234	0.846
Powerful	0.308	0.829

Kindness, good at bringing up children, sympathetic, loyal to partner, brave, and intelligent all loaded together on one factor, and when these six items were combined together into one measure, “parental qualities”, they showed a high Cronbach’s alpha of 0.873. The remaining two items, being rich and being powerful, loaded together on a second factor, and when both these items were combined together as one scale, “rich and powerful”, they produced a Cronbach’s alpha of 0.741.

When a 2 (Wealth: Rich vs. Poor) \times 3 (Altruism: High-cost vs. Low-cost vs. No) between-measures ANOVA was performed, it was found that the actor was rated higher for parental qualities when he was described as poor ($M = 4.35$, $SD = 1.33$) than when he was described as rich ($M = 4.02$, $SD = 1.51$)

($F(1, 279) = 11.15, p = 0.001, \eta_p^2 = 0.04$). In addition, ratings of parental qualities were significantly different across the altruism conditions ($F(2, 275) = 131.21, p < 0.001, \eta_p^2 = 0.46$). A post hoc analysis revealed that participants rated the actor as having better parental qualities in the high-cost ($M = 5.41, SD = 0.95$) than in the low-cost ($M = 4.11, SD = 1.23$) altruism condition ($p < 0.001, d = 1.18$). They also rated his parental qualities as being significantly higher in the high-cost than in the no ($M = 3.06, SD = 0.76$) altruism conditions ($p < 0.001, d = 2.73$) and in the low-cost than in the no altruism conditions ($p = 0.036, d = 1.03$). This suggests that altruism, even low-cost altruism, is seen as signalling better parenting qualities than no altruism at all (see Figure 4). No interaction was found between displays of altruism and the described level of wealth ($F(2, 276) = 1.66, p = 0.19, \eta_p^2 = 0.01$).

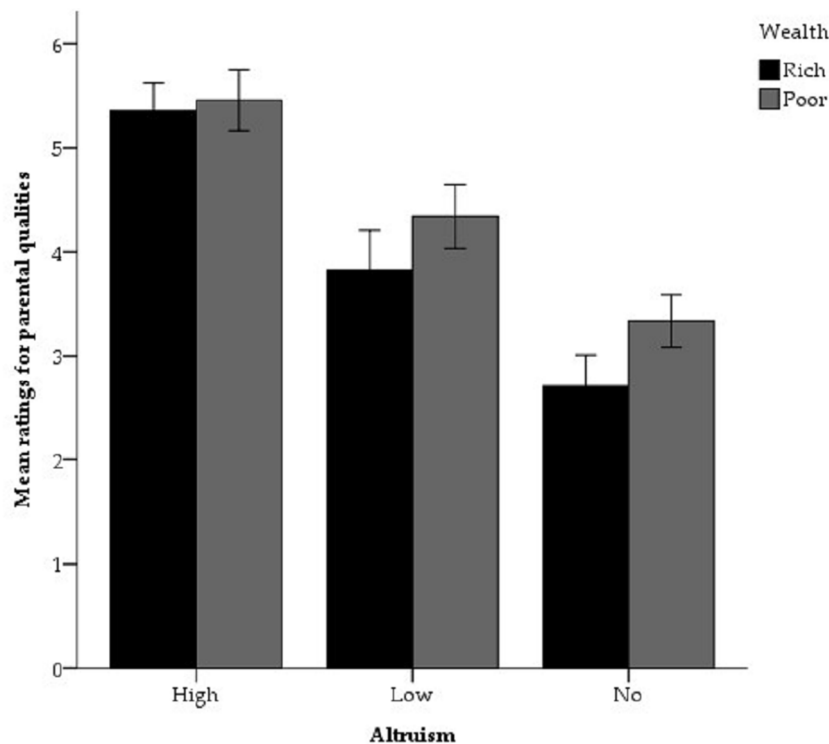


Figure 4. Mean ratings of parental quality in the high-cost, low-cost and no altruism conditions when the actor was described as rich compared to when he was described as poor (error bars represent 95% confidence intervals).

3. Discussion

In this study, actors re-enacted scenarios (through short video clips) based on [Goldberg's \(1995\)](#) and [Mulcahy's \(1999\)](#) street observations of giving to the homeless, and asked female participants to rate a male actor giving either a lot (£30), a little (£1), or nothing away to a homeless man. As hypothesised, regardless of whether the actor was described as rich or poor, the female participants considered the man more attractive when he donated money to a homeless man, but only when the donation was costly. Since costly signals are harder to fake, only honest signals of altruism convey true underlying mate quality ([Zahavi 1977](#)). Since there would be fitness consequences for women to mate with the wrong man ([Bateman 1948](#); [Trivers 1972](#)), it pays for women to pay attention only to mate qualities that are harder to fake ([Zahavi 1977](#)). Furthermore, it may be that this particular type of cost is linked to equality and willingness to share resources. An actor giving £30 away to someone who appeared homeless and significantly less socially well off than them may be considered more attractive because they are showing concern for social/human inequality. Interestingly, a recent study by [Bhogal et al. \(2020\)](#) found that people donating half (50%) of their money in a dictator game were considered more attractive than those who donated everything (100%). In the present study, the actor in the high-cost

condition gave away 100% of a £30 withdrawal, but in future studies, it would also be worth exploring whether the £30 donation is still viewed in the same way if it is, for example, 50% of a £60 withdrawal or 25% of a £120 withdrawal. Since giving away £1 was considered within most people's capabilities ([Charities Aid Foundation 2019](#)), we argue it was not found to be an attractive trait because it is not an honest signal of quality. Indeed, the participants may have considered £1 as derisory, especially after seeing the actor withdraw £30 from a cash machine.

To address the issue of financial donations as a measure of altruism, since the signals of "having resources" vs. "helping others" may be difficult to separate, here, the resource signal was separated by describing the man as having either high or low wealth. It was found that even in the low wealth conditions, the female participants rated the man as significantly more attractive when he donated than when he did not, and this was most important when considering the man as a long-term rather than a short-term mate. Whilst there are fitness benefits for women who pay attention to signs of resources in men ([Pawlowski and Dunbar 1999](#)), because women have a higher cost of mating with men who do not invest in their offspring ([Trivers 1972](#)), behaviours that signal willingness to share these resources should also be important.

Whilst this research highlights that help towards non-reciprocal strangers may signal mate qualities to women, it is important to note that in hunter–gatherer societies, kin also play an important role in mate selection ([Apostolou 2007](#)). Therefore, further research could explore whether altruistic signals by males are important for women's kin as they are for the women themselves.

The current study also hypothesised that altruism would only be considered relevant for long-term, as opposed to short-term, mating. This was found to be the case, with female participants showing no difference in their ratings of how likely they would be to have a one-night stand with the actor regardless of whether they saw him giving money to the homeless man or not. As predicted, the participants were, however, more likely to consider a long-term relationship with him if they witnessed him giving money to the homeless man in the video than if they did not, particularly if they witnessed him giving £30 as opposed to £1. Overall, females tend to place greater value in long-term mating over short-term mating, and this may explain why they place more attention on altruism cues here ([Buss 1989](#); [Farrelly 2013](#)). That said, it should be noted that one of the limitations when interpreting findings regarding women's self-reports of short-term vs. long-term mating preferences is that of social desirability ([Paulhus 1991](#)). For example, non-significant findings from women regarding short-term mating preferences may be due to a lack of willingness by women to self-report sexual behaviour ([Catania et al. 1996](#)). The means for women's short-term mating preferences were low across all three conditions, and this may be due to not wanting to admit willingness to have a one-night stand. In future research, less-easy-to-fake measures such as pupil dilation, heart rate, galvanic skin response, etc. could be used to test altruism as a mate preference instead.

Future research could also test whether the age of the male altruist has an impact on female mating preferences. Women tend to report preferences for males older, rather than younger, than themselves ([Buss 1989](#)). Whilst in our sample, we found no significant relationship between the age of the female observer and rating of the male's attractiveness, we do acknowledge that the male actor (who was 21 years old) was younger than the median age of the female sample (28 years old). It would be interesting to explore whether altruists older or younger, relative to the females' age, have an impact on mate preference.

The fourth and final hypothesis related to parenting skills. Because men can signal good parental qualities through the care and protection of others—for example, positive interactions towards children ([Brase 2006](#); [Guéguen 2014](#); [Roney et al. 2006](#)) or ownership of a pet ([Gray et al. 2015](#))—it was predicted that displays of altruism would be associated with good parenting skills. This, too, was found to be the case, supporting studies by those such as [Bhagal et al. \(2020\)](#), [Farrelly \(2013\)](#), [Margana et al. \(2019\)](#), and [Oda et al. \(2014\)](#), which suggest that altruism may be a signal of men's parental quality rather than of good gene quality. Whilst offspring's survival can be aided by parents passing on their genetic code (good gene quality)—because, compared to other mammals, human babies are more vulnerable

and require a longer period of parental care—there are also fitness benefits for mating with men who signal the potential for good future parental care (Portmann 1990; Trivers 1972).

Interestingly, intelligence loaded onto the same factor as the good parental qualities, and since altruism has been seen as a costly signal of intelligence (Millet and Dewitte 2007), it would be useful to further explore the link between altruism, intelligence, and parental quality. It also raises the question of whether the type of altruism displayed may affect the underlying signal of mate quality. For example, Oda et al. (2013) found that women preferred men who were altruistic towards family as long-term mates, but altruistic behaviours towards friends and acquaintances were found to be less important. In the current study, the target benefactor was a non-reciprocal stranger, but future work could explore the target of the donation in more depth and whether non-financial displays of altruism such as blood donations or helping/volunteering behaviour would affect altruism as a mate signal equally (Bhogal et al. 2019; Lyle et al. 2009; Moore et al. 2014).

Finally, altruism could also be a signal of emotional intelligence and future fidelity rather than resources. For example, Brown and Sacco (2019) found that women preferred deontological moral men more for long-term mating and perceived them as being less prone to infidelity. There are fitness advantages for women who mate with men with high resources, but not if he spends these resources on other women and offspring (Kruger et al. 2003). By showing a willingness to share resources with others, men can signal good parental “dad” qualities. Certainly, in the current study, perceptions of how loyal the man would be to his partner loaded well with other good parental mate qualities, and it may be interesting to explore this further in future research. Showing a willingness to donate to strangers, however, may not only signal willingness to share resources but also signal underlying personality qualities (such as human kindness and sympathy) that are important in good long-term partners. Palmer and Tackett (2018), for example, found that those who scored highly on a Dark Triad personality scale expressed less empathy and were significantly less likely to engage in stranger-based altruism. Women may therefore be picking up on cues to avoid potentially unwanted personality traits in mates.

One of the challenges of explaining the evolutionary adaptive benefits as to why we might help non-reciprocal genetic strangers is that it cannot be explained by the traditional methods of Kin or Reciprocal altruism (Hamilton 1964; Maynard Smith 1964; Trivers 1971). Here, we argue that there may be indirect benefits of displaying costly helping behaviour to strangers, as it may increase the altruist’s attraction as a potential mate.

In conclusion, then, the current findings suggest that some acts of costly altruism by men may be driven through female mate preference. Costly displays of altruism signal men’s honest ability to share resources with future offspring, and consequentially, women ancestors who selected for altruistic mates would have been at a fitness advantage compared to those who did not.

4. Materials and Methods

4.1. Participants

Female-only participants were recruited from a university in the South East of England ($n = 55$), through the social media website “Facebook” ($n = 140$), and through Amazon’s Mechanical Turk (MTurk), where participants were offered a financial incentive of USD 0.70 ($n = 200$). Out of 395 original responses, 76 were excluded due to technical issues with the online video. Further responses were excluded from the data set because they failed to correctly identify the attention checks ($n = 11$), stated they knew the male actor in the video ($n = 1$), described themselves as male ($n = 3$), or either classed themselves as homosexual or would not state their sexual preference ($n = 19$). The data from a total of 285 women (age range, 18–70; $M_{age} = 31.07$ years; $SD = 11.35$; median age = 28; 90% were under 50 years old) were analysed, of whom 195 reported being in a sexual relationship. Four of the participants described themselves as African (1.4%); five, as African American (1.8%); 23, as Asian (8.1%); 11, as

Black British (3.9%); 222, as Caucasian (77.9%); one, as Chinese (0.4%); 10, as Hispanic (3.5%); seven, as mixed race (2.5%); and two left this question blank (0.7%).

An a priori power analysis using G*Power (Faul et al. 2007) suggested that a minimum sample size of 251 participants was needed for the analysis, so the number of participants included in the analyses was therefore deemed to be large enough to detect findings with a medium effect size at $\alpha = 0.05$.

4.2. Design

Participants were randomly assigned to one of six conditions in a 2 (Wealth: Rich vs. Poor) \times 3 (Altruism: High-cost vs. Low-cost vs. No) between-participants design (see Table 2 for the breakdown of the number of participants per condition).

Table 2. The number of participants in each of the conditions.

Wealth of Man	Cost of Altruism	<i>n</i>
Rich	High	45
Rich	Low	46
Rich	No	39
Poor	High	49
Poor	Low	54
Poor	No	52
Total		285

4.3. Materials, Procedure and Ethics

Participants were asked to read a vignette about a man (describing him as either “rich” or “poor”) and then watch a short (40 s) video clip of him giving either much (£30), little (£1), or no money to a homeless man (actor). In the video, a young man (a 21-year-old actor) walks to a cash (ATM) machine and takes out three £10 notes (approximately USD 37). As he walks along the street and counts his money, he comes across a homeless man (also an actor) with his arm outstretched asking for money. In the high-cost altruism condition, the video shows him giving all of the £30 that he took out of the cash machine to the homeless man; in the low-cost altruism condition, he takes a £1 coin out of his back pocket and gives it to the homeless man; and in the no altruism condition, he gives nothing to the homeless man. All three video clips show the man starting with £30; therefore, it is only the level of giving that differs between the video scenarios (see Figure 5 for example screenshots).



Figure 5. Screenshots of male actor in the high-cost altruism condition.

The male actor was selected from eight volunteers (drama students from a university in the South East of England). Physical features and attractiveness play a large role in people’s preference for them as a mate (Ehlebracht et al. 2018). Therefore, to give this hypothesis a fair chance, the actor had to be considered as a possible mate and therefore physically attractive. Fifteen female participants rated

the photographs of the eight men on a six-point Likert scale, from 1 “not very attractive” to 6 “very attractive”. The actor with the highest attractive rating ($M = 4.90$) was chosen to act in the video clips.

After watching the video, the participants were asked demographic questions relating to their age, gender, and self-perceived wealth, and they were also asked to rate the actor for a number of mate qualities. Specifically, they were asked to rate him on a 7-point scale from 1 (“not at all”) to 7 (“very much”) as to how attractive they thought he was, how likely they would be to have a one night stand (short-term relationship) with him, and how likely they would be to consider having a long-term relationship with him. The participants were also asked to rate him on a set of 7-point scales from 1 (“not at all”) to 7 (“very much”) for how sympathetic, kind, brave, intelligent, rich, and powerful they thought he was as well as how good they thought he would be at bringing up children and how loyal they thought he would be to his girlfriend. This study was conducted in accordance with The Declaration of Helsinki, and prior to the commencement of the study, ethical approval was granted by the University of Kent’s Psychology Research Ethics Committee (ethics approval code—20122755). All participants gave their informed consent before taking part in the study.

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